

## THE HAND-ASSISTED LAPAROSCOPIC IN UROLOGY

### CASES: FIRST INDONESIA EXPERIENCE

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#### ABSTRACT

**Introduction:** Renal surgery with minimal invasive technique has become prevalent nowadays. Many laparoscopists have already interested in hand-assisted laparoscopic (HAL). The advantages of laparoscopy approach compared to traditional flank incision are lower pain and quicker recovery.

**Case Presentation:** Three urology cases were managed with HAL in Kariadi Hospital. On December 2018, a 63-year-old female with right kidney mass undergone HAL partial nephrectomy, a 61-year-old female with bilateral multiple kidney cysts, and a 53-year-old male with right giant kidney cyst undergone HAL kidney cyst unroofing. They were the first time done in Indonesia.

**Discussions:** All principles of standard transperitoneal laparoscopy in urology are used by HAL. The difference is in the use of their hands that go into the operation field that is used to expose, retract, dissect, and maintain hemostasis.

**Conclusions:** HAL is better at performing renal surgery when compared to traditional open surgery because HAL is a minimally invasive and safer technique. The advantages of HAL surgery compared to conventional open surgery are the low pain relief needs, the lower risk of blood loss and the shorter duration of hospital stay.

**KEYWORDS:** Hand-Assisted Laparoscopy, Renal Surgery, Endourology & Indonesia

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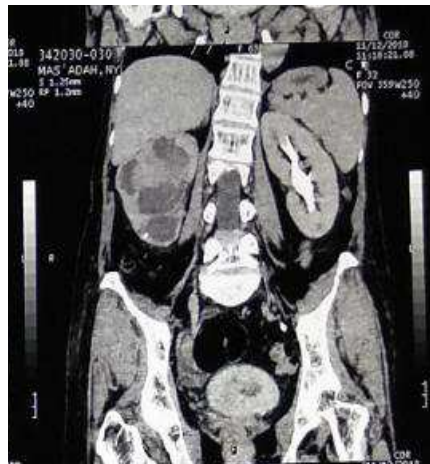
#### INTRODUCTION

Renal surgery with minimal invasive technique has become prevalent nowadays, because of lesser pain and quicker recovery. HAL was introduced in 1996, it was first performed in nephrectomy in pigs. They concluded that HAL nephrectomy procedure was easier and faster to perform than conventional laparoscopic nephrectomy. Since then, many researchers have reported their experience with HAL in laparoscopic surgery.<sup>1</sup> Three urology cases were managed with HAL in Dr. Kariadi Hospital Semarang on December 2018. HAL in urology has been done since two decades ago, these cases were performed for the first time in Indonesia.

## CASE SERIES PRESENTATION

### Case 1

A 63 year old female with right flank discomfort since 1 year before admission, there was history of hematuria, no vomiting, no fever, her weight was decreased gradually, because she was not disturbed by the symptom, she did not seek for treatment. Then 1 month before admission patient felt a lump on her right flank. On physical examination, we found single palpable mass, soft consistency, bumpy surface, firm boundary, tenderness and ballotement. Abdominal CT scan was done, the result was kidney mass, size 11.3 x 4.9 cm with multiple classification, right hydronephrosis, and cysts on 5<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> segment of liver, biggest size 1.4 x 1.56 cm (Figure 1).



**Figure 1: Right Kidney Mass**

The patient was placed in modified 45° flank position. Hand-assist device was placed in lower midline, while two additional ports were added in supraumbilical. A 10-mm camera port was placed near the umbilicus. A 5-mm working port was placed higher in the midline. Colon was mobilized to expose retroperitoneal structures and kidney was mobilized within Gerota's fascia. Single transverse incision in Gerota's fascia was performed to mobilize kidney. Once it was completely exposed, a 5-mm margin of normal parenchyma was marked by scoring the renal capsule with electrocautery applied through a hook electrode or laparoscopic scissors.



**Figure 2: Combination of Left Hand and Harmonicace® to Excise The Tumor(Case 1)**

The mass was excised using blunt dissection directed centrally along renal pyramids, enabling surgeon's hands to apply compression of the parenchyma for hemostasis (Figure 2). Kidney was replaced within Gerota's fascia. A retroperitoneal drain was placed through the lateral port.

## Case 2

Multiple renal cysts on both kidney was detected in a 61-year-old female with history of 1 year flank discomfort. MSCT abdomen identified nine cysts on each kidney (the biggest size  $\pm$  AP 10,3 x LL 93,0 x CC 8,91 cm on the upper pole) (Bosniak 1) (Figure 3).



**Figure 3: Multiple Cyst on Both Kidney**

The patient was placed in semilateral decubitus position. The surgeon is right handed. The dominant hand is used to work the laparoscopic instruments and the other hand is placed into the operative field (Figure 4). To access intraperitoneal space, colon was reflected medially by sharply incising line of Toldt from iliac vessels to splenic flexure. Operator's fingertips help reflected the mesocolon off anterior aspect of Gerota's fascia, while electrocautery shears or harmonic scalpel were used for dissection. The dissection was carried on a cephalic direction, freeing lateral splenic attachments from the diaphragm to the level of the gastric fundus. Splenorenal attachments were released, and Gerota's fascia was exposed and freed from all anterior attachments. Superior/anterior aspect of the adrenal gland and renal hilum were exposed. Using backhand to retract mesocolon medially, the anterior renal hilum was dissected using the first three digits of non-dominant hand and the harmonic scalpel, Maryland dissector, and electrocautery shears. The gonadal and/or adrenal veins were clipped and divided. The right side of right lobe liver was released from body sidewall by incising triangular ligament. Anterior and posterior divisions of the coronary ligaments were divided to allow medial retraction of the liver, exposing an upper aspect of Gerota's fascia. A liver retractor was placed through right upper quadrant port to hold the liver anteriorly/medially. Colon and hepatic flexure were mobilized medially to identify duodenum. A Kocher maneuver was performed using sharp and blunt dissection exposing cava vein and renal hilum. In all patients, squeezing the kidney with intra-abdominal hand proximal to resection site ensured temporary hemostasis. Three to four chronic plegit sutures were then placed to reapproximate the renal capsule. The Gerota's fascia was reapproximated over additional Surgicel to bolster the repair. A drain is placed through the lateral trocar site.



**Figure 4: Hand Assisted Laparoscopy  
In Renal Cyst Unroofing (Case 2)**

**Case 3**

A 53 year old male with right flank discomfort since 1 year before admission, there was no history of hematuria, no vomiting, no fever, then 3 months before admission the discomfort was getting worse. On physical examination, we found nopalpable mass, only tenderness on right flank and pain on percussion of CVA. Abdominal CT scan was done, the result was giant cyst with classification on lower pole of right kidney, size 5.4 x 6.4 x 6.2 cm, no hydronephrosis nor hydroureter (Figure 5).



**Figure 5: Right Kidney Cyst on Lower Pole of Right Kidney**



**Figure 6: Placement of Hand Device and Laparoscopic Ports for Right Handed Surgeon**



**Figure 7: Hand Assisted Laparoscopy in Renal Cyst Unroofing (Case 3)**

The patient was placed in the semilateral left decubitus (Figure 6). The right lobe of the liver was released from body sidewall by incising the triangular ligament. Anterior and posterior divisions of coronary ligaments were divided to allow better medial retraction of liver, exposing the upper aspect of Gerota's fascia. Colon and hepatic flexure were mobilized medially, identifying the duodenum. A Kocher maneuver was performed using sharp and blunt dissection exposing cava vein and renal hilum. Right renal cyst was excised (Figure 7). Three to four chromic sutures were placed to make close renal capsule. Gerota's fascia closed over additional Surgicel to bolster the repair. A drain was placed through the lateral trocar site.

## **DISCUSSIONS**

HAL in urology applies all principles of standard transperitoneal laparoscopy, and enabling surgeons to insert their hand into the operative field for exposing, retracting, dissecting, and maintaining hemostasis. Furthermore, surgeons are able to palpate vessels and organs minimizing injury to vital structures, particularly during difficult laparoscopy dissections.<sup>1</sup> The benefits of HAL include short operative times, ease of learning by inexperienced surgeons, and enhanced ability to manage difficult surgical time. Disadvantages of HAL include challenges with device handling, physical strain on hands, interference of hands in the operative field and the creation of a larger incision.<sup>2</sup>

Stifelman et al (2001) mentioned that there were advantages over traditional open surgery including painkillers requirement, decreased blood loss, length of hospital stay, and improvement of healing. (Level of Evidence: Level 4).<sup>1</sup>

DeVoe et al (2009) mentioned that HAL partial nephrectomy was associated with reduced blood loss, time of operation, time of warm ischemia, positive margin rates, and hospital stay related to open partial nephrectomy (Level of Evidence: Level 4).<sup>3</sup> HAL are superior to open abdomen examinations because of closeness of the lens and magnification by the laparoscopic video imaging and the details can be seen.<sup>4</sup>

HAL is not recommended in cases such as in young children cases, deep pelvic surgery and during retroperitonoscopy because the hand in the operative field takes up more working space, making visualization and exposure more difficult.<sup>1</sup>

## **CONCLUSIONS**

HAL advantages over traditional open surgery including less blood loss, painkillers needed, and length of hospital stay. The further research of HAL procedures in urology is needed to determine the role and usefulness of HAL, so larger randomized studies with longer follow-up are needed.

## **CONFLICT OF INTEREST**

The authors have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

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